UPPER TRISHULI-1 HEP (216MW)			
Client	Doosan Heavy Industries & Construction		
DHI's Subcontractor	Power Construction Corporation of China		
REPLY COMMENT			
Subcontractor	Power Construction Corporation of China		
Incoming Document			
Title of the Document	**Outline Drawing of Diversion Tunnel Lining**		
Document/Drawing No.	UT1-C-010-CVL-DG-42005 (3 sheets)	Revision	0B
Review Document No.	**UT1-HEP-DHI-PC-D-0019**	Reviewed Note No.	**RN-0115**
Received Date	**27.04.2022**	Review status	**RR**
Outgoing Document			
Previous Reply No.	RC-00XX	Previous Reply Date.	**14.04.2022**
Reply No.	RC-00XX	Reply date	**23.05.2022**

General Comments

The document under review is part of the Design Optimization Proposal process.

Comments to RC-0034

1. Maximum block length/ construction joints as per Contract ANNEX 13, Part C 17.3.1 is accepted.

Reply: Noted.

2. Concrete Plug design shall be considered as per drawings UT1_C_CFDR_039 to _047, DKJV 2018

(approved binding basic design documents).

Reply: □□□□□□□□□□□

Because of the optimization scheme of diversion tunnel has accepted by LTA, the water head loading at the plug has reduced. After calculation of the 20m length of plug (illustrated in RN 0113 reply to the plug) is enough, and Outline Drawing of diversion tunnel plugging will be submitted subsequently.

3. Tunnel lining:

A proof of the durability of the shotcrete at the tunnel roof as a permanent tunnel lining of the Diversion

Tunnel with pressurized flow and high flow velocities has not been provided yet especially in regards

of roughness and irregularity of shotcrete lining, refer to Contract annex 13-part c,1,15,1,9 (2) and

definition as per sheet 2 of 3 of the document under this revision: F4.

Reply: According to LTA comments, the roof of rock class II and class III have adopted reinforced concrete lining and the formed surfaces have revised as F4.

4. Weep holes including PVC-tubes as per Contract ANNEX 13, PART C,1. Construction

Specification,18.3.24 is accepted.

Reply: Noted.

5.Lean concrete:

Still no lean concrete is indicated in the documents under this revision. However as per request for

inspection RFI No. UT#1/NWEDC/DHI/PC/DT-I/IRSCL/007/0001, dated 17/03/2022, lean concrete

has been considered in the Diversion Tunnel.

Reply: The concrete legend has revised. And the diversion tunnel will adopt the whole section concrete lining.

Weep holes bottom slab:

Justification is missing, why weep holes in the bottom slab are not necessary.

Reply: According to structural calculation of diversion tunnel lining (UT1-C-010CCVL-DC-42005) Rev.B, the weep holes are used for reducing the external water pressure, as for the rock class III~IV and intersection there is no reduction of external water pressure in the calculation (please refer to 3.3.2 calculation of loads), so the reduction effect of external water pressure of weep holes is considered as safety margin. As for the rock class II, the whole section concrete lining, it is also unnecessary to arrange weep holes on the slab and the contractor will revised the calculation of diversion tunnel lining subsequently.

Construction joints:

Showing the arrangement of the construction joints (or other joint types) in the respective method

statement is acceptable. However, the method statement has to be revised regarding maximum

spacing of construction joints, see also comment 1. above.

Reply:□□□□□□□□□□

A typical detail of the joint sealings as per Contract ANNEX 13, Part C 17.1.1 shall be shown on the

concrete outline drawing under this review.

Reply: The typical detail of the joint sealings will be shown in Concrete Lining Method Statement of DT.

Transition between shotcrete/ concrete lining:

Comment 3. shall be considered.

Reply: The diversion tunnel has adopted the whole section lining for all the rock class. So there are no transition.

6. Pre-measures for plugging:

Concrete Plug design shall be considered as per drawings UT1_C_CFDR_039 to _047, DKJV 2018

(approved binding basic design documents).

Reply: Contractor will submitted the Outline Drawing of diversion tunnel plugging subsequently.

7. Typical cross section Diversion Tunnel Intake:

Cross section of Diversion Tunnel intake is shown in respective drawing which is acceptable.

Reply: Noted.

Diversion Tunnel Outlet Structure:

The final design shall be considered in as per UT1_C_DFDR_031, DKJV 2018 (approved binding

basic design documents). The respective detailed design (outline and reinforcement drawings) is still

pending and shall be provided as an earliest.

Reply: Accept.

8. It is not mentioned in which way the method statement will be revised.

Reply: □□□□□□□□□□.

9. The class of finish of the concrete surface is defined and indicated on sheet 2 of the outline drawings

under this revision which is acceptable. This definition is applicable for sections D1 and D2 as well.

Reply: Accept.